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Finite element analysis and die design of extrusion processes of radial-finned heat sink

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Abstract

There are many different types of manufacturing methods for heat sink fins in the current market. The aim of this study is to design an extrusion die for a radial-finned heat sink using a commercial finite element package, DEFORMTM 3D. We then conduct a series of simulation analyses with different variables such as friction factor, ram velocity, and fin gate stage of the die to evaluate the methods of decreasing the warping in the extrusion process. The die is assumed as a rigid body in the analyses. The results confirm the suitability of DEFORMTM 3D to design an extrusion die achieving a lower warping behavior of the radial-finned heat sink.

Key words: Finite Element Model (FEM);Radial-Finned Heat Sink;
Warping